UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,003	01/08/2004	Takeshi Nakajima	04002 /LH	7123

1933 7590 09/08/2008
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC
220 Fifth Avenue
16TH Floor
NEW YORK, NY 10001-7708

EXAMINER	
GE, YUZHEN	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
09/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/754,003	NAKAJIMA ET AL.	
	Examiner	Art Unit	
	YUZHEN GE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/27/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/27/2008 has been entered.

Examiner's Remark

Applicant's amendment, filed on 6/27/2008, has been received and entered into the file. Claims 1-36 are pending. The previous 102/103 rejections of claims 1-8, 10-17, 19-26 and 28-35 have been overcome in view of applicant's amendments/remarks and are hereby withdrawn.

Applicant's arguments with respect to claims 1, 10, 19 and 28 have been considered but are moot in view of the new ground(s) of rejection.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 10, 19 and 28 recite a wavelet function with "j" undefined. For examination purposes, the examiner will interpret "j" to be a real number.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8, 10-17, 19-26 and 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura (US Patent 6,823,090) in view of Mallat ("A Wavelet Tour of Signal Processing" Second Edition, Academic Press, 1998, pages 148-157 and 254-269, cited by IDS, Section 6.3, pages 189-200,).

Regarding claim 1, Matsuura teaches a method for processing image signals, comprising:

reading an image recorded on a recording medium so as to generate image signals representing said image (Fig. 1, an image is stored in a memory and when processing, it is read, col. 7, lines 28-50);

applying, to said image signals, a multi-resolution conversion processing of at least level 1, which is capable of reducing an image size of said image signals, so as to generate first-converted image signals from said image signals (Figs. 4A-4B and 5B, col. 5, line 53-col. 6, line 16, the conversion is from Fig. 4A to Fig. 4B, 402 represents the reduced sized image, a dwt is a multi-resolution conversion); and

applying a Dyadic Wavelet transform of at least level 1 to low frequency band component signals included in said first-converted image signals, so as to generate second-converted image signals from said first-converted image signals (Figs. 4A-4B and 5B, col. 5,

line 53-col. 6, line 16, Fig. 5B is the results of a Dyadic wavelet transform because the LL, HL2, LH2 and HH2 is the result of transforming LL1 after the first conversion, the transform/conversion is Dyadic because the transform shrinks both dimensions by 2).

wherein an image size of said first-converted image signals is smaller than the image size of said image signals (Figs. 4A-4D, the image 402 in Fig. 4B is smaller than that in Fig. 4A), while an image size of said second-converted image signals is identical to the image size of said first-converted image signals (applying the wavelet transform on 402 in Fig. 4B will result in a signal with the same size as that of 402 in Fig. 4B with LL, LH, HL and HH components).

However they do not explicitly teach the dyadic wavelet transform to be employed is defined as the wavelet function $\Psi_{i,j}(x)$ as recited in claim 1 and no down-sampling is performed in said dyadic wavelet transform.

In the same field of endeavor, Mallat teaches applying a dyadic wavelet transform with a wavelet function $\Psi_{i,j}(x)$ as recited in claim 1 (Eq. (5.67) on Page 148 is equivalent to that recited in claim 1, u, t, 2^j in Eq. (5.67) are respectively j, x, 2^i in $\Psi_{i,j}(x)$, the underline part of Eq. (5.67) multiplying by $1/\sqrt{2^j}$ is the wavelet function recited in claim 1, Eq. (5.67) just needs to multiply a square root of 2^j when wavelet function as recited in claim 1 is used, it is well known in the art that normalization factor of a transform can differ as long as the inverse transform is defined accordingly, similarly it is equivalent to fast dyadic wavelet transform defined in Page 154) and no down-sampling is performed in said dyadic wavelet transform (Fig. 5.7). It is desirable to synthesize and discriminate textures in images (1st paragraph of Section 5.5.3 on Page 156). Therefore it would have been obvious to one of ordinary skill in the art, at the time

of invention, to use the dyadic wavelet transform of Mallat in the method of Matsuura to process images to discriminate textures such as multiscale edges.

Regarding claim 2, Matsuura and Mallat teach the method of claim 1. Mallat teaches the method further comprising: applying a first image processing to said second-converted image signals generated by applying said Dyadic Wavelet transform (Section 5.5.3, finding local maxima or oriented wavelets is the first image processing, Page 190, Figs. 6.9 and 6.10).

Regarding claim 3, Matsuura and Mallat teach the method of claim 1. Mallat further teaches the method comprising: applying a first image processing to high frequency band component signals included in said second-converted image signals generated by applying said Dyadic Wavelet transform (Section 5.5.3, the oriented wavelets are constructed with both the high frequency and low-frequency components, Section 6.3 relates multi-scale edges to the local maxima of a wavelet transform that comprising high frequency components, Page 190, Figs. 6.9 and 6.10).

Regarding claim 4, Matsuura and Mallat teach the method of claim 3. Mallat teaches wherein said first image processing comprises suppressing a signal intensity of a specific pixel (pixels not on edges or that are not maxima, Fig. 6.10 (f)), which fulfils a predetermined condition established in advance among pixels represented by said high frequency band component signals (1st paragraph of Section 5.5.3, Figs. 6.9-6.11, especially Fig. 6.10(f), Maxima are those pixels modulus/intensity values are above a threshold, other pixel values are suppressed,

example 6.3 on pages 192-193, also see example 6.4 on Page 196, edges are thresholded, the signals being thresholded comprise high frequency band component signals).

Regarding claim 5, Matsuura and Mallat teach the method of claim 2. Matsuura teaches the method further comprising: applying a second image processing to said first-converted image signals generated by applying said multi-resolution conversion processing (Figs. 3-5B, col. 4, lines 16-col. 5, line 48).

Regarding claim 6, Matsuura and Mallat teach the method of claim 2. Matsuura teaches the method further comprising: applying a second image processing to high frequency band component signals included in said first-converted image signals generated by applying said multi-resolution conversion processing (Figs. 3-5B, col. 4, lines 16-col. 5, line 48).

Regarding claim 7, Matsuura and Mallat teach the method of claim 6. Matsuura teaches wherein said second image processing comprises suppressing a signal intensity of a specific pixel, which fulfils a predetermined condition established in advance among pixels represented by said high frequency band component signals (Figs. 3-5B, col. 4, line 16-col. 5, line 48, especially Steps 302a-302c-S303a-303c in Fig. 3).

Regarding claim 8, Matsuura and Mallat teaches the method of claim 1. However Matsuura does not explicitly teach wherein said multi-resolution conversion is an orthogonal wavelet conversion or a bi-orthogonal wavelet conversion. The linear wavelet transform used by

Matsuura is orthogonal although the orthogonality is not explicitly shown (col. 5, line 53-col. 6, line 39). In the same field of endeavor, Mallat teaches to use a multi-resolution conversion that is an orthogonal or a bi-orthogonal wavelet conversion to transform image signal (Section 7.3.1). It is desirable to use orthogonal or bi-orthogonal wavelet transform because of the mathematical properties of these transforms that enable efficient computation of coefficients (first paragraph of Section 7.3 of Mallat). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use a multi-resolution conversion that is an orthogonal wavelet conversion or a bi-orthogonal wavelet conversion so that efficient computation can be achieved.

Claims 10-17 are the corresponding apparatus claims of claims 1-8. Matsuura teaches an apparatus (Fig. 1). Thus Matsuura and Mallat teach claims 10-17 as evidently explained in the above-cited passages for claims 1-8.

Claims 19-26 are the corresponding computer readable storage medium claims of claims 1-8. Matsuura teaches a computer readable storage medium (Fig. 1, 109 in Fig. 1, col. 7, lines 33-62). Thus Matsuura and Mallat teach claims 19-26 as evidently explained in the above-cited passages for claims 1-8.

Claims 28-35 adds to claims 10-17 the following limitations:

a processing section to process said image signals so as to generate an output image signals representing said output image; and

a recording section to record said output image onto said outputting medium, based on said output image signals generated by said processing section.

Matsuura teaches

a processing section to process said image signals so as to generate an output image signals representing said output image (Fig. 1, col. 7, lines 28-32, a computer is a processor); and

a recording section to record said output image onto said outputting medium, based on said output image signals generated by said processing section (Fig.1, image display is regarded as the outputting medium, col. 7, lines 28-32, a printer also prints to an outputting medium). Thus Matsuura and Mallat teach claims 28-35 as evidently explained in the above-cited passages.

Allowable Subject Matter

5. Claims 9, 18, 27 and 36 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. A statement of reasons for the indication of allowable subject matter is presented in the previous office action and will not be repeated here.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUZHEN GE whose telephone number is (571)272-7636. The examiner can normally be reached on 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yuzhen Ge
Examiner
Art Unit 2624

/Yuzhen Ge/
Examiner, Art Unit 2624